IN THE SPECIFICATION:

Please AMEND the TITLE *to read as follows:*

METHOD ~~AND APPARATUS~~ FOR DETECTING SLOW AND SMALL CHANGES OF ELECTRICAL SIGNALS ~~INCLUDING THE SIGN OF THE CHANGES, AND CIRCUIT ARRANGEMENT FO THE EXACT DETECTION OF THE PEAK VALUE OF AN ALTERNATING VOLTAGE~~.

Please AMEND the paragraph at page 1, lines 11 to 16 to read as follows:

The invention relates to a method ~~and apparatus~~ for detecting slow and small changes of electrical signals including the sign of the changes, to determine the end-of-charge condition of batteries being charged ~~and circuit arrangement for the exact detection of the peak value of an alternating voltage. Under the term "electrical signals" a direct current voltage or quantities that can be represented by the measurement of direct current voltage and understood, such quantities are e.g. output signals of current or temperature probes.~~

Please AMEND the paragraph at page 2, lines 1 to 7 to read as follows:

Typically such a task is the determination of the end-of-charge moment in case of charging batteries. Especially, when the battery is charged intensively with a high charging current, the charging process would be finished as soon as the fully charged state has been reached, otherwise the battery might suffer an irreversible damage.

~~Thew end-of-charge state is often indicated by a very low change of the battery voltage which can be below 1 mV, or such an indication can be the end of a similarly low decrease of the battery voltage.~~

Please AMEND the paragraph at page 2, lines 8 to 15 to read as follows:

In the booklet of Motorola Inc. SG 73/D Rev. 17, 1998 of the Master Selection Guide series, an integrated battery charger circuit type MC 33340P is described that can detect the decrease of the battery voltage by a sensitivity of 4 mV. The required accuracy is much higher than this value, and it is not sufficient to detect the decrease of the voltage only, one has to determine the tendency of the change as well. The tendency means the determination whether the signal has decreased by a predetermined extent, it has increased at least by that extent or it has remained unchanged i.e. the fluctuations have not exceeded the predetermined level. <u>The battery voltage starts decreasing after it has reached its maximum. There are several types of batteries, wherein there is no sudden maximum but rather a steady voltage condition through a longer period of time, and the life of the battery gets reduced when it is charged throughout that voltage plateau.</u>

Please CANCEL the paragraphs at page 2, line 28 to page 3, line 13.

Please AMEND the paragraph at page 3, lines 16 to 20 to read as follows:

One object of the invention is to provide a method ~~and an apparatus~~ that makes possible both the safe detection of the slow and small changes of a direct current voltage and the determination of the tendency of the changes, wherein the changes are by three decimal orders of magnitude smaller than the DC level ~~and which has a circuit design that facilitates mass production~~.

Please AMEND the paragraph at page 3, lines 21 to 23 to read as follows:

A further object of the invention is to provide a method ~~a circuit arrangement~~ that can determine the end-of-charge moment of a battery. ~~carry out the peak detection of repetitive pulse signals without any fluctuation of the DC level and which has the required accuracy.~~

Please AMEND the paragraph at page 3, line 24 to page 4, line 14 to read as follows:

It has been discovered that the end-of-charge state is often indicated by a very low change of the battery voltage which can be below 1 mV, or such an indication can be the end of a similarly low decrease of the battery voltage.

~~These objects can be met by apparatus for detecting slow and small changes of electrical signals including the sign of the changes, comprising:~~

~~-a controlled switch connected in the path of the signal to be detected;~~

~~-a capacitor connected with a first terminal to the switch and charges to the voltage of said signal;~~

~~-an amplifier with an input connected to second terminal of the capacitor and generating a pulse signal corresponding to the charge or discharge current of the capacitor having corresponding proper sign;~~

~~-a window comparator having first and second reference voltages (+UK, -UK) determining a window, and a signal input connected to output of the amplifier for indicating whether the output signal of the amplifier lies in the range defined by the window or it has been crossed in negative or positive direction;~~

~~-storage and logical units each having first and second storage means; and~~

~~-a pulse generator connected to control input of the controlled switch to make it closed for periodically repeated sampling periods, and also connected to the storage and logical units;~~

~~wherein said first storage means storing the logical state of the window comparator taken during said pulse signal with proper sign, and a predetermined section of each pulse of said pulse generator reading such stored values of said first storage means into said second storage means.~~

Please ADD the following paragraph at page 4, line 15:

<u>According to the invention this condition is met if the slope of change of the charging current I_{ch} or of the battery voltage U_B (dU or dI) decreases below a threshold level, and this condition is monitored by a separate voltage or current monitor circuit.</u>

Please AMEND the paragraph at page 4, line 20 to 25 to read as follows:

Fig. 1 is a simplified circuit diagram of an exemplary embodiment of the detection circuit according to the invention;

Fig. 2 shows the forms of the pulses of the pulse generator 9, and

Figs. 3a to 3k show the time diagrams of the signals that can be measured at a few number of characteristic places of the detection circuit. ~~; and~~

~~Fig 4 is the circuit diagram of a current detector.~~

Please AMEND the paragraph at page 4, line 28 to page 5, line 11 to read as follows:

In the circuit shown in Fig. 1 the signal to be monitored is a direct current voltage of a battery and its line is coupled to input terminal 1. A controlled switch 2, realized by a contact of relay 10 or by a high quality electronic switch, is connected in series with the input terminal 1. The other wire of the switch 2 is connected to an arm of a capacitor 3 of precision design, and the other arm is connected to resistor 4 and to positive input of a controlled amplifier 5 that comprises a feedback loop. The output of the controlled amplifier 5 is coupled through a branch to its own negative input, whereas the branch comprises a potentiometer 6 and an RC member, also connected to the negative input. The potentiometer 6 is adapted for adjusting the amplification. When a short unipolar voltage pulse is coupled to the positive input of the controlled amplifier 5 and it decays, under the effect of the feedback a half-wave pulse will appear at the output that has an inverse phase relative to the pulse at the input.

Please AMEND the paragraph at page 8, line 25 to page 9, line 13 to read as follows:

The rate of change of the voltage at the input terminal 1 has expedient significance ~~significant at a wide range of applications~~. The sensitivity of the measurement of the rate of change can be adjusted within a wide range by means of changing the period time of the sampling pulses. In a given configuration the circuit has a predetermined

sensitivity threshold. This can be e.g. 1 mV. Since the period time of the sampling is chosen to 1 minute, then the sensitivity of the rate of change will be 1 mV/min, but in that case the data representing the new states will arrive in 1 minutes periodicity. If the task is constituted by the determination of the end-of-charge moment of a battery, and this condition is related to the fact when the earlier changing battery voltage gets stabilized or constant, then the sensitivity of 1 mV/min is very high. Such a condition can be applied at normal charging tasks. In case of quick chargers the charging current can be so high that the 1 minute interval will prove to be too long between two subsequent sensing, since an overcharging that can last till 1 minute might decrease the lifetime of the battery. In that case the sampling period should be shortened, whereby the sensitivity for the end-of-charge will be smaller, but at the same time the danger of overcharging the battery will practically be eliminated. The fact that the charging process will be finished at a level slightly below the fully charged state has no significance at fast chargers.

Please CANCEL the paragraphs at page 9, line 18 to page 11, line 14.